Long Beach Zika Community Assessment for Public Health Emergency Response (CASPER)

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Long Beach Department of Health and Human Services

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Contents

Background

Zika virus is a mosquito-borne flavivirus transmitted by the bite of infected *Aedes aegypti* and *Aedes albopictus*. Zika virus can also be spread by sexual contact with an infected person, blood transfusions, laboratory contamination, and perinatal transmission. In adults, the symptoms of Zika virus disease are typically absent or mild and self-limiting; however, Zika infection in pregnant women has been linked to adverse outcomes in newborns, including microcephaly, eye defects, hearing loss and impaired growth (Russell K, 2016). Additionally, there is an association between Zika and Guillain-Barre' Syndrome (GBS), a disease affecting the nervous system.

In 2016, Zika virus made international headlines for the large scale and rapid spread of the outbreak that had originated in Brazil at the end of 2015. As more cases were reported throughout South America, Polynesia, and Southeast Asia, it became clear that there were many unknowns about Zika, and that it could cause devastating birth defects to those born to mothers who had become infected. In the U.S. in 2016, local transmission of Zika was reported in Florida, caused by a combination of high amounts of *Aedes aegypti* mosquitoes, a dense population, and people traveling to and from Zika affected areas. There was concern at the time that local transmission of Zika could occur in additional areas of the U.S. such as Southern California, due to population density, travel to Zika-affected areas, and increasing presence of *Aedes* mosquitoes in the area. In June 2016, Zika Virus Infection and Flavivirus Infection of Undetermined Species were added to Title 17 Sections 2500, 2502, and 2505 of the California Code of Regulations as required and immediately reportable to local health departments.

At that time in 2016, West Nile Virus (WNV), which is primarily transmitted by *Culex* mosquitoes, was endemic to Long Beach. *Culex* behaviors differ from *Aedes*, in that they typically bite during dusk and dawn, while *Aedes* bite during the day, and *Culex* prefer various mammals for their bloodmeals, while Aedes prefer humans and can be much more aggressive biters. Each year at the start of mosquito season, the Long Beach Department of Health and Human Services (LBDHHS) sends out a press release regarding prevention of mosquitoes (catered to the behavioral characteristics of *Culex*) and the LBDHHS Vector Control Program does extensive work trapping and testing mosquitoes in Long Beach to monitor for WNV. Throughout the years of trapping and mosquito abatement, Vector Control had never found evidence of *Aedes* within the City, but *Aedes* had already been detected in several cities bordering Long Beach.

The Long Beach Department of Health and Human Services (LBDHHS) developed a Zika response plan with two goals: to identify whether *Aedes* mosquitoes were established in Long Beach, and to educate and prepare the public in the event of local transmission of Zika in Southern California. In early 2017, LBDHHS implemented a public outreach campaign based on those goals by developing a multifaceted plan to reach the public, using three main points: Report, Remove, Protect. A Zika hotline and email address were established for residents to report day-biting mosquitoes in order to locate *Aedes* mosquitoes, as they tend to bite aggressively during the day. The public was advised to remove breeding sites around the home, and protect themselves by wearing mosquito repellent both in Long Beach and when traveling to Zika-affected areas. Some of the outreach efforts included:

Planning

- Written Zika Emergency Response Plan for all stages of Zika virus transmission in Southern California based on threat level of local transmission
- Bimonthly meetings of an internal Zika Planning Committee including laboratory, nursing, public health emergency management, vector control, and epidemiology staff

Education

- Community presentations on Zika to neighborhood associations, Council Districts, City Departments, and volunteer groups
- Social Media Campaign for #ZIKAFREELB, urging residents to Report, Remove, and Protect (Report day biting mosquitoes, Remove breeding sites, and Protect from mosquito bites)
- Updated website with messages for the public and providers
- Message insert in the City's utility bill urging residents to report day-biting mosquitoes
- Multiple billboard messages on the 405 freeway urging residents to report day-biting mosquitoes
- Zika Quick Reference Guide for medical providers, and distributed along with presentations to various health provider groups throughout Long Beach
- Consultation to providers on how/when to test for Zika and clinical and patient management of Zika virus
- Over 3,000 Zika Kits distributed to households throughout Long Beach that included information on mosquitoes, mosquito repellent, condoms, and standing water tabs
- Published video shorts with LBTV on Zika and how the public can protect themselves, currently airing on local channels and on social media
- Press releases and media alerts regarding new developments on *Aedes* mosquitoes or Zika in Long Beach
- Mosquito education campaign tailored to children and presented at summer camps
- Combined outreach and education efforts with Vector Control team, exhibiting live mosquitoes, larvae, and mosquito fish throughout Long Beach

Reporting and Response

- Zika Hotline set up for the public to call with questions related to Zika and/or mosquito complaints, which are then triaged by trained responders and referred to Vector Control who visited homes, set traps, and sprayed if necessary
- Screening and testing of persons with suspect Zika infection in-house through the Long Beach Public Health laboratory for residents who met the testing criteria
- Reporting pregnant women with Zika to the U.S. Pregnancy Registry
- Babies born to mothers with Zika in Long Beach being assigned a Public Health Nurse, who works closely with the family for up to a year after the baby is born to monitor for congenital defects and support the mother
- Door-to-door community outreach when an *Aedes* mosquito was identified in a new area in Long Beach

- Health Advisory distributed to local healthcare providers and laboratory directors informing them of changes to Title 17 and providing guidance for reporting and submitting specimens to the Long Beach Department of Health and Human Services.

Collaboration with Local Partners

- Representation on LA County's Zika Core Planning Team
- Participation on the Zika/*Aedes* LA County Outreach Campaign workgroup
- Representation as a panelist on LA County's *Keep Zika Out!reach: Tools to Protect your Community educational workshop*, with elected officials from LA County in attendance
- Staff participation in the Zika Emergency Response Planning Workshop, hosted by Los Angeles County
- Presentation on monthly California Department of Public Health (CDPH) Zika call to local health jurisdictions throughout California on piloting an outreach program in Long Beach to keep local providers up to date on Zika
- Collaboration with CDPH Vector Control and other neighboring vector control districts to compare notes, mosquito abatement challenges, etc.

The Zika Hotline and email address were established in early March of 2017. As the activities described above were implemented, calls to the hotline increased. In June 2017, a Long Beach resident called to report day-biting mosquitoes, and upon Vector Control investigation, *Aedes aegypti* mosquitoes were trapped and identified in Long Beach for the first time. Since the first discovery, *Aedes aegypti* mosquitoes have been identified in several locations throughout Long Beach, almost all of which were located through calls from residents to the hotline reporting day-biting mosquitoes.

This was a very large prevention/public outreach campaign for LBDHHS, and in order to assess whether the messaging was reaching the public, the Public Health Emergency Management Program (PHEM) decided to conduct a Zika Community Assessment for Public Health Emergency Response (CASPER).

CASPER is an epidemiologic tool developed by the Centers for Disease Control and Prevention (CDC) to assess public health needs in both disaster and non-disaster settings. Using a two-stage, household-based sampling approach, CASPER is designed to provide information about health status, basic needs, knowledge, attitudes, or practices of a community in a quick and low-cost manner (CDC, 2012). LBDHHS decided to conduct a Zika CASPER in order to evaluate whether messaging about Zika had reached the general public and to assess general knowledge of mosquitoes and mosquito-borne diseases. General mosquito abatement and protection questions were included because of other mosquito-borne viruses that exist in Long Beach such as West Nile Virus, which is endemic in the area and results in hospitalizations and deaths in Long Beach each year. This Zika CASPER was unique in that it included a vector control component, in which all of the census blocks selected for CASPER were also assessed for mosquito breeding and/or mosquito abatement. The primary objectives of the Long Beach Zika CASPER were:

1. Evaluate residents' knowledge of Zika virus
2. Assess knowledge of all mosquito-borne diseases and how to protect from mosquitoes

3. Identify and manage potential mosquito breeding sites (Vector Control)

LBDHHS had already begun to plan the CASPER when the *Aedes aegypti* were first discovered in Long Beach, so some additions and minor changes were made to the questionnaire once the species was confirmed. The data collected during the CASPER will be used to:

1. Target future messaging around Zika and other public health emergencies
2. Strengthen Zika Response Plan based on findings from CASPER
3. Focus efforts of Vector Control to areas most likely to breed *Aedes* mosquitoes

The Long Beach Zika CASPER was conducted with assistance from the CDPH Division of Environmental and Occupational Disease Control, Long Beach Health, Long Beach Police Department (LBPD), Long Beach Fire Department (LBFD), and Disaster Preparedness Departments, Long Beach Medical Reserve Corps (LB-MRC) volunteers, neighboring health jurisdiction employees (from Los Angeles County, Pasadena, and Orange County), and other student volunteers. The CASPER was conducted July 19–21, 2017. The following report describes the methods, results, discussion, and recommendations from the information collected from the CASPER.

Methods

Two-Stage Sampling

CASPER's two-stage cluster sampling design originates from the World Health Organization's Expanded Program on Immunization Rapid Health Assessment (CDC, 2012). In the first stage, a sampling frame for the assessment is selected, that captures the area in which the CASPER results will be generalized. Next, 30 clusters (here, census blocks), are randomly selected from the sampling frame with probability of selection proportional to the number of housing units in the cluster. The second stage of sampling is done by the interview teams in the field, who randomly select seven housing units from each selected census block, with a goal of 210 interviews total. The information collected from the 210 interviews is weighted upon analysis to generalize the data to the entire sampling frame.

The sampling frame used for this Zika CASPER was the City of Long Beach, given that LBDHHS Zika outreach was aimed primarily at those who live in the City, and the census blocks were used as the clusters, as they are pre-defined and do not overlap. Long Beach has a total of 4,811 census blocks, 171,632 housing units, and an estimated population of 470,130. Census blocks and housing unit data was pulled from the 2010 United States Census via ArcGIS. The clusters were sampled by CDPH in, using a custom ArcGIS toolbox created by the CDC. Clusters were selected based on the total number of housing units in Long Beach.

Interview teams conducted the second stage of sampling in the field using systematic random sampling, where they approached every n^{th} housing unit, determined by dividing the number of units in the census block by seven. They were provided with a map of each cluster, with a randomly assigned directional starting point, for example North East or South West. Starting points were pre-designated by assigning a number one through four for each direction, and using a random number generator to assign each direction to a census block. The maps contained the number of units within the census block and the n^{th}

housing unit. The team was instructed to count "n" homes before approaching each household for interview. Interview teams approached selected housing units three times before replacing them with another household for interview.

Questionnaire

The Zika CASPER questionnaire was developed by the PHEM and Epidemiology Programs within LBDHHS, along with assistance from CDPH. The 75 questions were primarily yes/no and true/false, and focused on three main areas: general mosquito prevention and breeding, knowledge of Zika, and travel. All questions were aimed at collecting responses on the household rather than the individual level. All forms and questionnaires were translated into Spanish.

The Vector Control data for the Zika CASPER was collected via a form created by both PHEM and the Long Beach Vector Control Programs. A form was completed for each of the 30 census blocks selected for interview, and was designed to capture whether the randomly selected census blocks presented with high numbers of breeding sites and whether further intervention was needed, such as mosquito abatement or setting traps. Vector Control staff conducted the assessment within three days of the household-level portion of the Zika CASPER.

All Hazards Incident Management Team

The CASPER was conducted using the city's All Hazards Incident Management Team (AHIMT). This team is comprised of members of LBDHHS, LBPD, LBFD, and the Disaster Preparedness Department. The AHIMT manages planned events and uses best practices as the standard for emergency management across the country. The AHIMT utilizes the Incident Command System (ICS) structure in managing incidents and events. For the CASPER, the ICS roles included an Incident Commander, Public Information Officer (PIO), Policy Group, and Planning, Operations, Finance, and Logistics sections.

Command staff and interview teams met at a Command Post each morning for operational period briefings, which included progress updates, safety notes, and any adjustments to interview teams or assignments. Interview teams were then deployed to the field. Teams were separated into three divisions (A, B, and C) that each had a hub, which was either a fire or police station. Interview teams would visit their division hubs for breaks, snacks, to turn in surveys, and would check out with their division supervisor at their respective hubs at the end of each day. On the final day of the CASPER, interview teams returned to the Command Post to turn in final surveys and complete evaluations.

On the final day of the CASPER, AHIMT requested the interview teams not visit one of their assigned clusters due to an incident that could possibly jeopardize team safety. There had been a shooting adjacent to one of the selected census blocks the evening prior, and LBPD had intelligence that there may be more retaliation gun violence as a result. The AHIMT structure provided a great deal of safety to the interview teams, as information on the shooting was not public by the next morning when the

teams were arriving at their census blocks, thus we would have had no knowledge of the danger had LBPD not been participating.

Training and Interviews

The Command Staff held a half-day just-in-time training session on the first day of the CASPER on July 20. The training was conducted by LBDHHS staff, ICS Command Staff, and CDPH partners. The training included CASPER method overview, interview methods, systematic random sampling in the field, interview skills in the field, safety, logistics, and communications. There were 22 interview teams of two people each the first day of the CASPER, 21 teams the second day, and 20 teams on the final day of the CASPER. Teams consisted of LBDHHS staff, CDPH staff, and volunteers from various local universities and volunteer organizations. A majority of the teams contained at least one Spanish speaker. When interview teams encountered a household that spoke a language other than Spanish or English, the team called the Command Post, who arranged interviews with a Vietnamese or Khmer speaker. Three interviews were completed by phone, as requested by the respondent of those selected households.

Teams provided respondents with a letter from the Health Officer introducing the CASPER, a copy of the consent form, and a Zika Prevention Kit, which included information on Zika, mosquito repellent, condoms, and a magnet on how to prevent mosquitoes from breeding around the home. All materials were printed in both English and Spanish. Respondents were required to reside in the selected housing unit and be 18 years of age or older to participate. Interview teams read the consent form aloud and the respondent was required to give verbal consent before the interview took place.

Data Analysis

Weighted analysis was applied to the data based on the total number of housing units in Long Beach to represent the entire City. Answers with fewer than 10 responses were not weighted (California Department of Public Health, 2015). LBDHHS calculated unweighted and weighted frequencies and percentages, and 95% confidence intervals for the weighted percentages for those with greater than 10 responses. Data from the vector surveys was not weighted and is presented as collected. Data from the household questionnaires and Vector surveys was entered into Epi Info 7, and all data was managed and analyzed using Epi Info 7 and IBM SPSS Statistics v25.

Results

Interview teams completed 196 of a maximum 210 interviews, a 93.3% completion rate. There was one incomplete survey. Interview teams conducted interviews at 41.7% of the approached households. Of those households where an individual answered the door and contact was made, 64.3% agreed to complete the interview (Table 1). The Vector Control Program conducted a vector assessment on 100% of the 30 randomly selected census blocks. Ninety percent of the randomly selected census blocks fell in

the Long Beach Vector Control District, while the remaining 10% were under jurisdiction of Greater Los Angeles Vector Control District (Table 17).

Demographics

A small majority of homes were single family structures (52.1%), while 47.9% were multiple unit homes. The Incident Command Team conducted outreach in the days preceding the CASPER, including social media posts and automated phone calls to residents living in selected census blocks. As a result, 10.9% of households knew of the CASPER prior to the interview team's visit. English was the primary language spoken at 68.6% of households, with Spanish (21.0%) and Khmer (2.9%) being the other two primary languages. Number of residents per household ranged from one to 17, with a weighted median of two household members (Table 2).

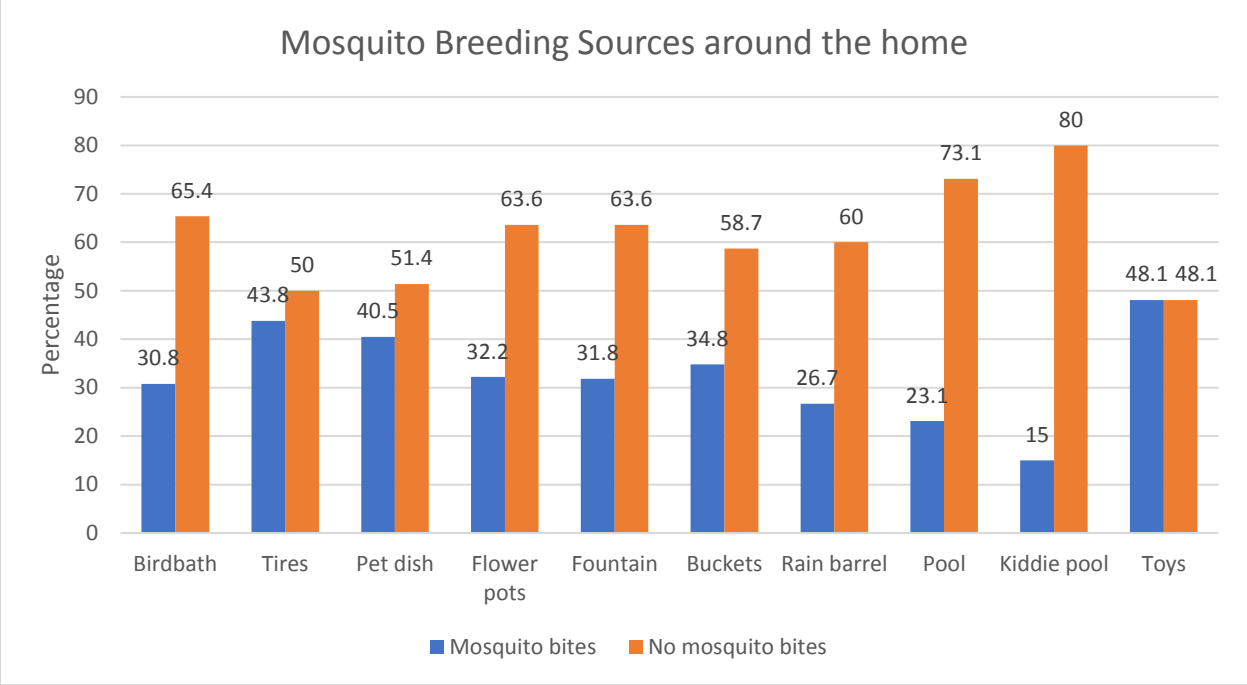
Mosquito Activity, Beliefs, and Prevention

A majority of households (61.7%) reported not having been bitten by mosquitoes in the past month, while of the 31.4% of those who reported being bitten, most reported bites in the evening (41.2%) and nighttime (48.6%). Of those reporting being bitten by mosquitoes, 16.7% reported bites during the daytime. Only a small minority of households (12.6%) used mosquito repellent in the past month, and of those who did, 54.2% used a product containing DEET (Table 3).

Households were asked about mosquito-borne diseases in the area. Most households (67.6%) knew that mosquitoes in Long Beach carry disease, and nearly half (49.4%) correctly responded that mosquitoes in the area can transmit West Nile Virus. Households were not as sure of other mosquito-borne diseases, with half (50.3%) responding that mosquitoes in Long Beach carry Zika (36.0% responded that they did not know), and most respondents did not know whether mosquitoes carry Dengue or Chikungunya (60.0% and 76.2%, respectively). Well over three quarters (84.7%) did know that different types of mosquitoes can transmit different types of diseases (Table 4).

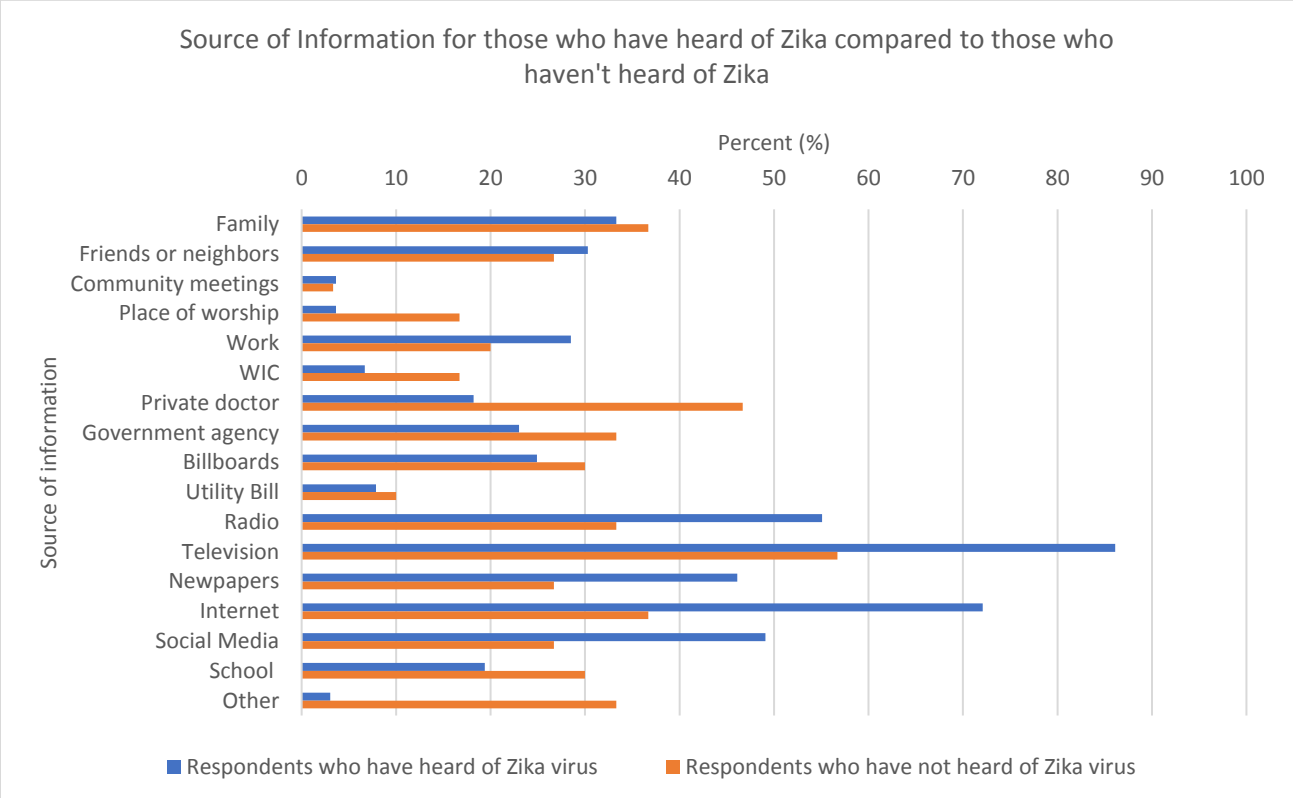
While most households (94.6%) stated that mosquito control is important to household members, and 68.2% knew that mosquito repellent can protect from Zika and WNV, many either believed or did not know if mosquito repellent is harmful for children (38.0% thought it was harmful, 25.1% did not know) or harmful for pregnant women (26.5% thought it was harmful, while 41.1% did not know). Only a minority of households (30.4%) thought aerial spraying for mosquitoes was safe for humans (Table 5).

Households were asked whether they had taken certain actions to prevent mosquito breeding around the home. Nearly half (46.6%) reported having dumped outdoor containers holding water, and a majority (76.3%) reported using full screens on all open windows and doors (Table 6). Few (5.9%) reported applying chemical, larvicide, or mosquito dunks directly to water around the home. Most households (76.0%) reported having at least one breeding sources around the home:



Zika Knowledge and Prevention

Most households (84.1%) had heard of Zika virus (Table 8). The source of health-related information varied among those who had heard of Zika and those who had not.



Among the 165 households who had heard of Zika prior to the interview, 80.7% answered correctly when asked if Zika can be transmitted from a pregnant mother to her baby, 71.6% correctly believed that babies born to mothers with Zika may have severe birth defects, and 81.6% knew that traveling to areas that have Zika is unsafe for pregnant women (Table12).

There were many other areas of Zika in which households either had incorrect responses or did not know the answer. Many households believed that Zika often causes severe illness and death in adults (45.8% incorrectly said yes, 37.3% did not know). Another area in which households had incorrect information or were unsure was treatment (38.2% thought there was treatment, while 41.2% did not know) and vaccine (28.2% incorrectly said a vaccine for Zika exists, while 53% did not know). Only 6.1% of households correctly answered that dogs and cats cannot become sick from Zika. Half of households (50.4%) knew of the City's Zika Hotline number (Table 12).

Households usually answered correctly when asked how to avoid getting Zika, which included wear long sleeved shirts and pants (87.0%), use mosquito repellent (93.8%), avoid travel to Zika affected areas (94.9%), turn over, cover, or clean items that hold water (93.5%), install, repair or use window and door screens (96.9%) and use a condom or abstain from sex after traveling to Zika affected areas (72.7%). Many (43.1%) reported that wearing a face mask around those infected with Zika would help protect from contracting Zika, and 22.3% reported that they did not know (Table 13).

Travel

Of the 16.5% of households reporting that at least one person had traveled outside of the United States in the past three months, most (73.2%) reported traveling to Zika affected areas (primarily Mexico) (Table 15). The primary reason for travel was vacation (58.3%) followed by visiting family (20.3%). Similarly, 16.9% of households planned to travel outside of the U.S. in the next three months, and 68% of those reported future travel to Zika affected area (Table 16). Reasons for traveling in the next three months included 32% vacation and 46.5% to visit family.

Vector Control

Almost all (90%) of the census blocks selected for this CASPER were in the Long Beach Vector Control District (Table 17). Many potential breeding sites were identified at the 30 census blocks, including box drains (73.3%), potted plants (60.0%), puddles (36.7%), and children's toys (26.7%). Almost all census blocks had storm drains (90.0%), and 63.3% had water collecting in the curbs. Vector control found mosquito larvae at one census block, and left traps at two different census blocks. Vector Control found adult *Culex* mosquitoes at over half (60.0%) of the blocks visited, and reported that 53.3% needed follow up mosquito abatement, which includes treatment of storm drains and setting mosquito traps. No *Aedes* were found in the traps set out during the CASPER.

Discussion and Conclusion

Preparing for potential local transmission of Zika virus in Long Beach is one of the largest prevention campaigns that LBDHHS has implemented. The purpose of the Long Beach Zika CASPER was to evaluate whether the messaging around Zika had reached the community, and level of knowledge around Zika and mosquito prevention. In addition, the results will be used to identify areas where messaging and outreach can be improved.

While planning the CASPER, *Aedes aegypti* were found in Long Beach for the first time. The press release received a great deal of local, national, and even international attention, which likely increased the number of people in Long Beach that had heard of or had some basic knowledge of the disease. For example, one local news station used the headline "Zika-carrying mosquitoes found in Long Beach," which could be misleading, as the mosquitoes found did not have the virus (KABC, 2017). As a result, the Zika Hotline was very busy with calls from people worried that they had been exposed or may have contracted Zika in Long Beach. Thus, the CASPER was timely, as it helped identify which misconceptions existed around Zika in Long Beach.

One issue that arose during the outreach campaign was that it was difficult to explain exactly how Zika could potentially come to Southern California in a few short words for a simple tagline or poster. For example, for local transmission to happen the following must occur: first, someone would need to travel to a Zika-affected area, contract Zika, return to California within three weeks, and be bitten by an *Aedes* mosquito who then bites the person's neighbor or family member, who then contracts Zika. Moving forward, it may be beneficial for LBDHHS to develop short, concise messaging for the public regarding the fact that we do not have Zika in Long Beach but could in the future, to avoid unfounded fear or panic.

In terms of demographics, the data collected is fairly consistent with U.S. Census QuickFacts data reported on Long Beach (Census, 2017). Non-English speaking households constitute 45.5% of households, while in the CASPER we found 32.5% of households did not spoke a primary language other than English. Persons per household in Long Beach are reported as an average of 2.8, and in the CASPER the median was 2 people per household. These data comparisons demonstrate that the randomly sampled housing units were a fairly representative sample of the population of Long Beach.

A majority of respondents had some basic knowledge of mosquitoes, but were less clear on which diseases the mosquitoes carry. An overwhelming majority of households thought Zika was an important issue in their community, but few actually took measures to protect themselves, and many had misconceptions about some of the measures. Similar findings have been shown in other areas with mosquito-borne disease, whereby the population has knowledge of the diseases and how they are transmitted, they do not necessarily take action to prevent themselves from becoming infected (Leslie TE, 2017). Regarding Zika, this could be due to perceived risk. With a focus on pregnant women and Zika, many who are not women of child bearing age may perceive Zika as low risk. Mosquito repellent such as DEET is safe for children and pregnant women (EPA, 2017), but this CASPER revealed that many households thought mosquito repellent was harmful or did not know if it was harmful for pregnant women and children. Because of this perceived danger of mosquito repellent, it could be that households' perceived risk of mosquito repellent was higher than their perceived risk of contracting Zika.

There were distinct differences between sources of health information among those who had heard of Zika and those who had not. Most of the LBDHHS outreach around Zika was disseminated through multimedia channels such as social media (Twitter, Instagram, Facebook), local television stations, and through the LBDHHS website. This correlated with those who had heard of Zika, who get their health information through television, internet, radio, and social media. Among those who had not heard of Zika, health-related information most often came from television, private doctors, and family. Because LBDHHS had only done limited amount of outreach to local private doctors and medical groups at the time of the CASPER, this gap identified an area on which to focus more in the future. LBDHHS is in close contact with local infectious disease clinicians and infection preventionists in the local hospitals, however disseminating information to individual private providers regarding public health information is often more difficult, as private clinics often change ownership and emails and contact information change frequently. Knowing that there is a subset of the population that relies on these providers for health information underlines the importance of reaching out to local family practice doctors or general practitioners when new developments in public health occur.

Among those households who had heard of Zika, there was some general disease information that seemed to be well-known, which was primarily the association between Zika and pregnancy resulting in birth defects. This is consistent with news media stories that focused heavily on the birth outcomes of those who were born to mothers with Zika and the dangers around pregnancy. Given the news coverage of severe birth defects, this may have influenced their understanding of symptoms in newborns versus adults. While sexual transmission of Zika accounts for only a small proportion of the cases in the U.S. (of 5,102 symptomatic Zika cases in the U.S. in 2016, only 46, or 0.9% were transmitted via sexual contact (CDC, 2017)), we did include that in our messaging, and even included condoms in our Zika Kits. However, that message seems to not to have resonated, as the media's focus on mosquito and perinatal forms of Zika transmission may have overshadowed our efforts. This is consistent with studies in areas of local transmission, where people were aware that Zika can be transmitted by mosquitoes, but very few identified sexual transmission as a form of acquiring Zika (Prue CE, 2017).

Of those planning to travel outside of the U.S. in the next three months and those who traveled out of the U.S. in the past three months, most were traveling to Zika-affected areas. Those who had traveled in the past three months had primarily done so for vacation (58.3%), while those who were planning to travel were primarily going to visit family (46.5%). This difference may be due to the time the CASPER was conducted in late July, because people are more likely to travel for vacation purposes during the summer months. This data does show that regardless of reason for travel, Long Beach residents who travel are primarily going to places with active Zika transmission.

In terms of the Vector Control portion of the CASPER, the locations they visit in their day-to-day work are based on previous knowledge of known breeding sites or resident complaints regarding mosquito bites or standing water. The Vector portion of the CASPER required that they visit areas not necessarily considered to be "high risk" in terms of mosquito breeding. Nevertheless, this proved to be useful, as they visited census blocks that they had not inspected in some time, and were able to identify adult *Culex* mosquitoes at over half (60.0%) of the selected blocks. While *Culex* cannot transmit Zika, they transmit other diseases to humans such as WNV.

The Vector Control Program also noted that over half (53.3%) of the blocks needed some sort of follow up, and will now include those blocks into their regular schedule. One possible reason that Vector Control discovered areas with breeding sites despite not having received complaints about mosquitoes

or standing water could be that the residents in those particular areas are not as tied in to City services and may be unaware that there is a number to call to report these types of things. It may be worthwhile to do more outreach to areas with residents who may not be as well-versed as some regarding City services, to ensure all areas of Long Beach with high potential to breed mosquitoes are on the radar of the City's Vector Control Program.

This Long Beach Zika CASPER proved to be a valuable measurement of residents' knowledge of mosquito-borne diseases, how to protect from mosquitoes, and Zika virus disease and transmission. The data gathered here will be used to form future public outreach campaigns, either focused on mosquito-borne diseases or anything else that requires health-related information disseminated to Long Beach residents. Based on the results of the Zika CASPER, LBDHHS will consider the following:

1. In future outreach campaigns, identify potential misconceptions or aspects that may cause the most fear or potential for misconception early in the process, and develop messaging around those particular pieces. In terms of Zika, emphasize the fact that Zika is not locally transmitted in Long Beach or California, only that the mosquitoes with the potential to transmit the virus has been found in the area.

2. Include messaging around the safety of mosquito repellent, particularly in terms of pregnant women and children, when conducting outreach to residents regarding any type of mosquito-borne disease.

3. Research methods of reaching residents through other means than social media and news media. Increase quality of messaging and distribution of messages to providers, who many trust as a primary source of health information. Develop an accurate, up to date database of providers in Long Beach.

4. Consider a regular Vector Control assessment of census blocks or neighborhoods not necessarily known to be breeding mosquitoes in the event that something has changed in the area, such as increase in standing water, construction sites that may harbor mosquito breeding sites etc., as not to rule out these areas as free of mosquito-borne transmission of disease.

5. Conduct targeted outreach to areas/neighborhoods of Long Beach that may have limited knowledge of City services such as the Zika hotline or how to report standing water, to identify potential mosquito breeding sites in these areas as well.

Limitations

The data presented in this report was based on responses from households that were randomly sampled based on available U.S. Census Data from 2010. The weighted analysis does not account for changes in the number of housing units from 2010-2016. In addition, interview teams had to approach greater than seven households at each census block to achieve seven interviews for that block. Replacement of originally sampled households may have affected results, as this CASPER was run from Thursday to Saturday, we may have misrepresented those who work during those times. Interview teams were not able to reach every randomly selected housing unit, as some were closed to public access due to high

security, despite partnering with Long Beach Police to help gain access to buildings. On the evening of the second night of the CASPER, there was a gang-related homicide adjacent to one of the selected census blocks, and Long Beach Police advised CASPER Incident Command staff that it would be dangerous to be in the area in the days following for fear of retaliation, or additional gun violence. This likely resulted in lack of representation from this selected census block.

This Zika CASPER is the result of collaborative effort among the Long Beach Department of Health and Human Services, CDPH, LBPD, LBFD, Long Beach Disaster Preparedness, various volunteers, and staff from neighboring health jurisdictions. The data presented here is meant to guide future outreach efforts in the City, not only around mosquito-borne disease, but other relevant health issues and outbreaks that LBDHHS and/or other City Departments may encounter.

Figures and Tables

Figure 1: CASPER Sampling Frame with Selected Census Tracts by Division

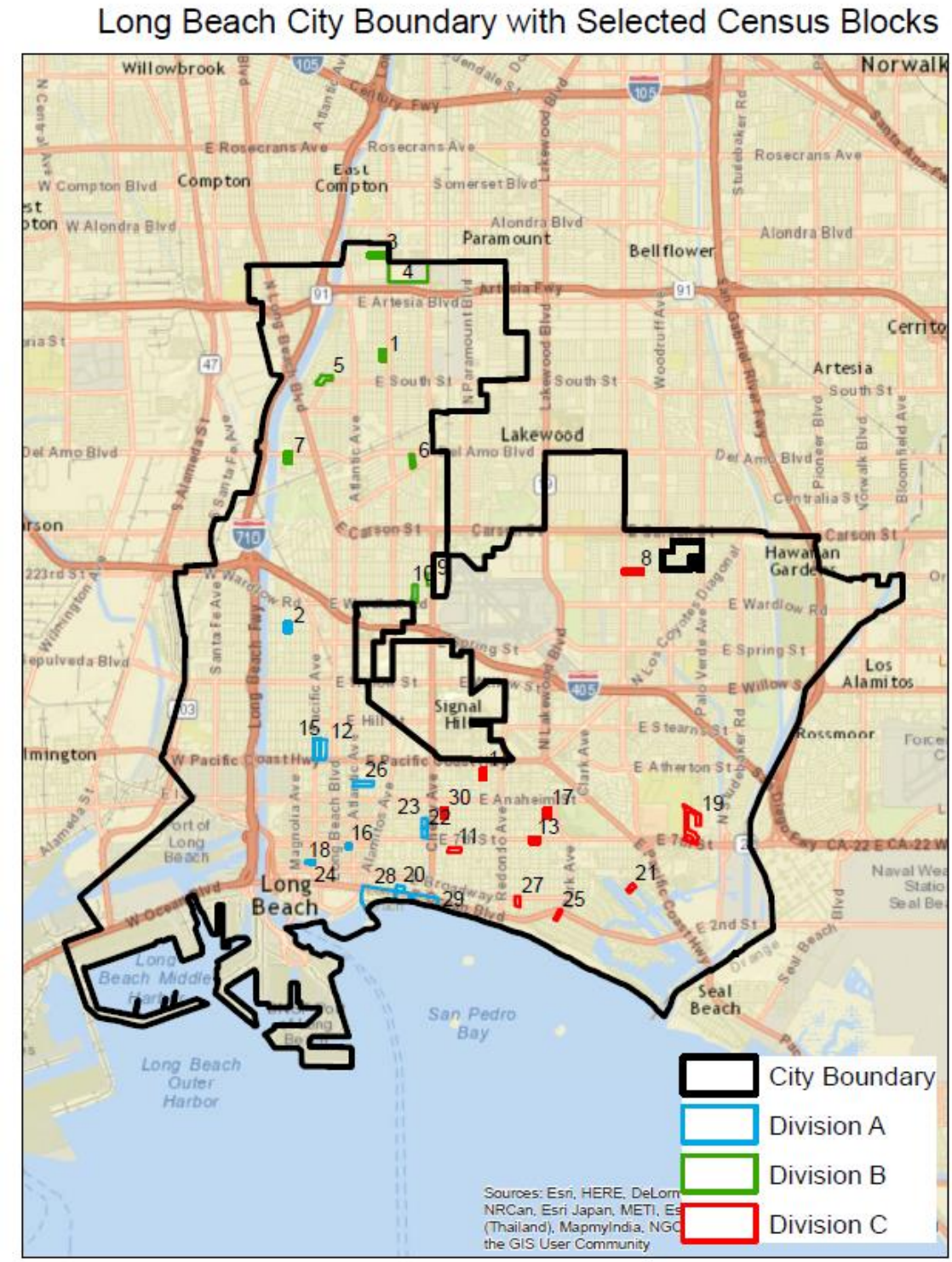


Table 1: Questionnaire response rates for Long Beach Zika CASPER (N=197*)

	Rate	Percentage (%)
Contact Rate	196/470	41.7
Completion Rate	196/210	93.3
Cooperation Rate	196/305	64.3

*N=1 incomplete survey

Table 2: Weighted and unweighted frequencies of descriptive characteristics for households in the City of Long Beach, CA

	Unweighted (N=197)		Weighted (171,632)	
Characteristic	N	%	N	% (95% CI)
Type of Structure				
Single Family	103	52.3	89,412	52.1 (51.9-52.3)
Multiple Unit	94	47.7	82,219	47.9 (47.7-48.1)
Hear about his survey prior to us talking to you today				
Yes	22	11.2	18,634	10.9 (10.7-11.0)
No	174	88.3	152,180	88.7 (88.5-88.8)
Don't Know	1	0.51	-	-
Main language spoken in household				
English	133	67.5	117,772	68.6 (68.4-68.8)
Spanish	44	22.3	35,961	21.0 (20.8-21.2)
Khmer	6	3.1	-	-
Other	14	7.11	12,995	7.57 (7.45-7.70)
Bilingual English/other	8	57.1	-	-
Household size				
1-2	94	47.7	87,124	50.8 (50.5-51.0)
3-4	64	42.1	52,634	30.7 (30.5-30.9)
5-6	24	8.63	19,615	11.4 (11.3-11.6)
≥ 7	15	1.52	12,259	7.14 (7.02-7.27)
Households with ≥ 1 member in the following age groups (n=196)				
<2	16	8.16	13,077	7.66 (7.53-7.78)
2-17	67	34.2	54,759	32.1 (31.8-32.3)
18-64	171	87.2	149,728	87.7 (87.5-87.8)
≥ 65	45	23.0	37,432	21.9 (21.7-22.1)

Table 3: Weighted and unweighted frequencies of households in Long Beach, CA regarding mosquito prevention

	Unweighted (N=197)		Weighted (N=171,632)	
Characteristic	N	%	N	% (95% CI)

Bitten by mosquitoes in or around home within past month				
Yes	58	29.4	53,900	31.4 (31.2-31.6)
No	125	63.5	105,962	61.7 (61.5-62.0)
Don't Know	14	7.11	11,769	6.86 (6.74-6.98)
Time of day household members were bitten (n=58)				
Early morning (5am-7am)	2	3.45	-	-
Day time (7am-4pm)	5	8.6	-	-
Evening (4pm-8pm)	26	44.8	22,190	41.2 (40.8-41.9)
Night (8pm-5am)	30	51.7	26,112	48.6 (48.0-48.9)
Don't Know	2	3.5	-	-
Used mosquito repellent in the past month				
Yes	25	12.7	21,699	12.6 (12.5-12.8)
No	171	86.8	149,115	86.9 (86.7-87.0)
Don't Know	1	0.5	-	-
Type of mosquito repellent used (n=25)				
DEET	11	56.0	9,930	54.2 (45.1-46.4)
Picaradin	2	8.0	-	-
Oil of lemon/eucalyptus	3	12.0	-	-
Other	6	24.0	-	-
Don't Know	4	16	-	-

Table 4: Weighted and unweighted frequencies of household beliefs regarding mosquito-borne diseases in Long Beach, CA

	Unweighted (N=197)		Weighted (N=171,632)	
Characteristic	N	%	N	% (95% CI)
Mosquitoes in Long Beach carry disease				
True*	134	68.0	116,056	67.6 (67.4-67.8)
False	22	11.2	19,247	11.2 (11.1-11.4)
Don't Know	41	20.8	36,328	21.2 (21.0-21.4)
Mosquitoes in Long Beach carry West Nile Virus				
True*	101	51.3	84,794	49.4 (49.2-49.6)
False	27	13.7	27,951	16.3 (16.1-16.5)
Don't Know	68	34.5	58,069	33.8 (33.6-34.1)
Refused	1	0.51	-	-
Mosquitoes in Long Beach carry Dengue				
True	49	24.9	41,028	23.9 (23.7-24.1)
False*	32	16.2	26,807	15.6 (15.5-15.8)
Don't Know	115	58.4	102,979	60.0 (59.8-60.2)
Refused	1	0.51	-	-
Mosquitoes in Long Beach carry Zika				
True	98	49.8	86,306	50.3 (50.1-50.5)
False*	27	13.7	22,721	13.2 (13.1-13.4)
Don't Know	71	36.0	61,788	36.0 (35.8-36.2)
Refused	1	0.51	-	-
Mosquitoes in Long Beach carry Chikungunya				
True	22	11.2	18,634	10.9 (10.7-11.0)
False*	25	12.7	21,372	12.5 (12.3-12.6)

Don't Know	149	75.6	130,808	76.2 (76.0-76.4)
Refused	1	0.51	-	-
Different types of mosquitoes can transmit different types of diseases				
True*	166	84.3	145,356	84.7 (84.5-84.9)
False	8	4.06	-	-
Don't Know	23	11.7	19,738	11.5 (11.4-11.7)

Table 5: Weighted and unweighted frequencies of household beliefs regarding mosquitoes and mosquito prevention in Long Beach, CA

	Unweighted (N=197)		Weighted (N=171,632)	
Characteristic	N	%	N	% (95% CI)
Mosquitoes cannot breed in very small amounts of water				
True	51	25.9	42,622	24.8 (24.6-25.0)
False*	113	57.4	100,773	58.7 (58.5-59.0)
Don't Know	33	16.8	28,237	16.5 (16.3-16.6)
Mosquitoes can live inside the home as well as outside				
True*	169	86.2	146,909	86.0 (85.4-86.2)
False	12	6.12	10,421	6.10 (6.00-6.21)
Don't Know	15	7.65	13,485	7.89
Mosquito control is important to you and your household members				
True	186	94.4	162,315	94.6 (94.5-94.7)
False	8	4.06	-	-
Don't Know	3	1.52	-	-
Mosquitoes are usually around the size of a quarter				
True	62	31.5	51,939	30.3 (30.1-30.5)
False*	116	58.9	102,938	60.0 (59.7-60.2)
Don't Know	19	9.64	16,754	9.76 (7.62-9.90)
There are ways to prevent mosquitoes from breeding around your home				
True*	169	85.8	147,522	86.0 (85.8-86.1)
False	9	4.57	-	-
Don't Know	19	9.64	16,754	9.76 (9.62-9.90)
Using mosquito repellent while outdoors can protect from Zika and West Nile Virus				
True*	134	68.0	117,037	68.2 (68.0-68.4)
False	32	16.2	28,319	16.5 (16.3-16.7)
Don't Know	31	15.7	26,276	15.3 (15.1-15.5)
Mosquito repellent is harmful for children to use				
True	76	38.6	65,261	38.0 (37.8-38.3)
False*	75	38.1	63,259	36.9 (36.6-37.1)
Don't Know	46	23.4	43,112	25.1 (24.9-25.3)
Mosquito repellent is safe for pregnant women				
True*	65	33.2	55,330	32.4 (32.2-32.6)
False	53	27.0	45,237	26.5 (26.3-26.7)
Don't Know	78	39.8	70,247	41.1 (40.9-41.4)

Aerial spraying for mosquitoes is safe for humans				
True*	61	31.0	52,103	30.4 (30.1-30.6)
False	65	33.0	55,658	32.4 (32.2-32.7)
Don't Know	70	35.5	63,054	36.7 (32.2-32.7)
Refused	1	0.51	-	-

*Indicates correct response

Table 6: Weighted and unweighted frequencies of households regarding prevention of mosquito breeding around the home in Long Beach, CA

			Weighted (N=171,632)	
Characteristic	N	%	N	% (95% CI)
Cleaned roof gutters				
Yes	29	14.7	24,315	14.2 (14.0-14.3)
No	128	65.0	113,318	66.0 (65.8-66.3)
Don't Know	15	7.6	12,913	7.52 (7.40-7.65)
N/A	25	12.7	21,086	12.3 (12.1-14.4)
Dumped outdoor containers holding water				
Yes	95	48.2	79,891	46.6 (46.3-46.8)
No	71	36.0	65,751	38.3 (38.1-38.5)
Don't Know	10	5.08	8,173	4.76 (4.66-4.86)
N/A	21	10.7	17,817	10.4 (10.2-10.5)
Covered outdoor containers holding water				
Yes	53	26.9	43,644	25.4 (25.2-25.6)
No	98	49.8	89,412	52.1 (51.9-52.3)
Don't Know	7	3.55	-	-
N/A	39	19.8	32,855	19.1 (19.0-19.3)
Scrubbed inside of containers to remove mosquito eggs				
Yes	47	23.9	39,353	22.9 (22.7-23.1)
No	111	56.4	99,424	57.9 (57.7-58.2)
Don't Know	13	6.60	10,624	6.19 (6.08-6.31)
N/A	26	13.2	22,230	13.0 (12.8-13.1)
Used full screens on all open windows and doors				
Yes	156	79.2	131,012	76.3 (76.1-76.5)
No	37	18.8	37,350	21.8 (21.6-22.0)
Don't Know	4	2.03	-	-
Kept screens on windows and doors in good repair				
Yes	152	77.1	127,130	74.1 (73.9-74.3)
No	36	18.3	35,593	20.7 (20.6-20.9)
Don't Know	5	2.54	-	-
N/A	4	2.03	-	-
Sprayed or fumigated for mosquitoes around the home				
Yes	37	18.8	31,180	18.2 (18.0-18.4)
No	149	75.6	131,462	76.6 (76.4-76.8)
Don't Know	11	5.58	8,990	5.24 (5.13-5.34)
Applied chemical, larvicide, or mosquito dunks directly to water				
Yes	12	6.09	10,134	5.90 (5.79-6.02)

No	161	81.7	140,943	82.1 (81.9-82.3)
Don't Know	15	7.61	12,586	7.33 (7.21-7.46)
N/A	9	4.57	-	-
Used insect light traps				
Yes	11	5.58	8,990	5.24 (5.13-5.34)
No	178	90.4	155,490	90.6 (90.5-90.7)
Don't Know	7	3.55	-	-
N/A	1	0.51	-	-
Other* (n=195/n=169,997)				
Yes	26	13.3	21,250	12.5 (12.3-12.7)
No	162	83.1	142,700	83.9 (83.8-84.1)
Don't Know	7	3.59	-	-

*Missing data n=2

Table 7: Weighted and unweighted frequencies of potential mosquito breeding sources around households in Long Beach, CA

	Unweighted (N=197)		Weighted (N=171,632)	
Characteristic	N	%	N	% (95% CI)
Bird Bath	26	13.2	21,577	12.6 (12.4-12.7)
Tires	16	8.12	13,077	7.62 (7.49-7.75)
Pet water dish	37	18.8	30,239	17.6 (17.4-17.8)
Flower pots	121	61.4	106,984	62.3 (62.1-62.6)
Fountain	22	11.2	18,307	10.7 (10.5-10.8)
Buckets	46	23.4	38,209	22.3 (22.1-22.5)
Rain barrel	15	7.61	12,586	7.33 (7.21-7.46)
Pool or hot tub	26	13.2	21,863	12.7 (12.6-12.9)
Kiddie pool	20	10.2	16,959	9.88 (9.74-10.0)
Children's toys	27	13.7	22,067	12.9 (12.7-13.0)

Table 8: Weighted and unweighted frequencies of households who have heard of Zika virus before in Long Beach, CA

	Unweighted (N=197)		Weighted (N=171,632)	
Response	N	%	N	% (95% CI)
Yes	165	83.8	144,253	84.1 (83.9-84.2)
No	32	16.2	27,379	16.0 (15.8-16.1)

Table 9: Weighted and unweighted frequencies of where households received Zika virus information in Long Beach, CA

	Unweighted (N=165*)		Weighted (N=144,253)	
Characteristic	N	%	N	% (95% CI)
Family	55	33.3	46,872	32.5 (32.3-32.7)
Friends or neighbors	50	30.3	42,458	29.4 (29.2-29.7)
Community meetings	6	3.64	-	-

Place of worship	6	3.64	-	-
Work	47	28.5	45,196	31.3 (31.1-31.6)
Women, Infants, and Children Program (WIC)	11	6.67	8,990	6.23 (6.11-6.36)
Private doctor	30	18.2	24,846	17.2 (17.0-17.4)
Government agency	38	23.0	32,651	22.6 (22.4-22.9)
Billboards	41	24.9	35,103	24.3 (24.1-24.6)
Utility Bill	13	7.88	10,625	7.37 (7.23-7.50)
Radio	91	55.1	78,256	54.3 (54.0-54.5)
Television	142	86.1	124,801	86.5 (86.3-86.7)
Newspapers	76	46.1	65,302	45.3 (45.0-45.5)
Internet	119	72.1	106,003	73.5 (73.3-73.7)
Social Media	81	49.1	73,352	50.9 (50.6-51.1)
School	32	19.4	26,607	18.6 (18.4-18.8)
Other**	5	3.03	-	-

*Household who reported having heard of Zika virus before the CASPER interview.
**Other response includes: Columbian government (n=1), Email (n=1), hospital (n=1), Public (n=1), word of mouth (n=1)

Table 10: Weighted and unweighted frequencies of where households receive health information who haven't heard of Zika virus in Long Beach, CA

	Unweighted (N=30*)		Weighted (N=25,745)	
Characteristic	N	%	N	% (95% CI)
Family	11	36.7	9,603	37.3 (36.7-37.9)
Friends or neighbors	8	26.7	-	-
Community meetings	1	3.33	-	-
Place of worship	5	16.7	-	-
Work	6	20.0	-	-
Women, Infants, and Children Program (WIC)	5	16.7	-	-
Private doctor	14	46.7	11,442	44.4 (43.8-45.1)
Government agency	1	3.33	-	-
Billboards	9	30.0	-	-
Utility Bill	3	10.0	-	-
Radio	10	33.3	8,786	34.1 (33.6-34.7)
Television	17	56.7	15,120	58.7 (58.1-59.3)
Newspapers	8	26.7	-	-
Internet	11	36.7	10,216	39.7 (39.1-40.3)
Social Media	8	26.7	-	-
School	9	30.0	-	-
Other**	1	3.33	-	-

*Missing data (n=2) **Other response includes magazines (n=1)

Table 11: Weighted and unweighted frequencies of households who think Zika is an important issue in their community, Long Beach, CA

	Unweighted (N=165)		Weighted (N=144,253)	
Response	N	%	N	% (95% CI)
Yes	135	81.8	118,467	82.1 (81.9-82.3)
No	18	10.9	15,651	10.9 (10.7-11.0)
Don't Know	12	7.27	10,134	7.03 (6.89-7.16)

Table 12: Weighted and unweighted frequencies regarding Zika virus beliefs

	Unweighted (N=165)		Weighted (N=144,253)	
Characteristic	N	%	N	% (95% CI)
Zika is preventable				
True*	125	75.8	110,948	76.9 (76.7-77.1)
False	10	6.06	8,786	6.09 (5.97-6.21)
Don't Know	30	18.2	24,518	17.0 (16.8-17.2)
You can get Zika from having sex with someone who has Zika				
True*	59	35.8	49,528	34.3 (34.1-34.6)
False	31	18.8	31,180	21.6 (21.4-21.8)
Don't Know	75	45.5	63,645	44.1 (43.8-44.3)
The mosquitoes that carry Zika only bite during dusk and dawn				
True	29	15.6	24,641	17.1 (16.9-17.3)
False*	68	41.2	63,708	44.2 (43.9-44.4)
Don't Know	68	41.2	55,903	38.8 (38.5-39.0)
The mosquitoes that carry Zika have black and white stripes on their legs				
True*	23	12.0	19,779	13.8 (13.6-14.0)
False	7	4.27	-	-
Don't Know	134	81.7	117,936	82.2 (82.0-82.4)
Zika can be passed from a pregnant mother to her baby				
True*	131	79.4	116,465	80.7 (80.5-80.9)
False	3	1.82	-	-
Don't Know	31	18.8	25,336	17.6 (17.4-17.8)
Zika can be passed to others by breathing the same air as someone who is infected				
True	13	7.88	11,279	7.82 (7.68-7.96)
False*	98	59.4	88,840	61.6 (61.3-61.8)
Don't Know	54	32.7	44,134	30.6 (30.4-30.8)
Babies born to mothers with Zika may have severe birth defects				
True*	122	73.9	103,265	71.6 (71.4-71.8)
False	3	3.182	-	-
Don't Know	40	24.2	38,535	26.7 (26.5-26.9)
Traveling to areas that have Zika is safe for pregnant women				
True	16	9.70	13,404	9.29 (9.14-9.44)
False*	133	80.6	117,772	81.6 (81.4-81.8)
Don't Know	16	9.70	13,077	9.07 (8.92-9.21)
Men can sexually transmit Zika to their partners for up to six months after becoming infected				
True*	71	43.0	65,547	45.4 (45.2-45.7)
False	11	6.67	8,990	6.23 (6.11-6.36)
Don't Know	83	50.3	69,715	48.3 (48.1-48.6)

Women can sexually transmit Zika to their partners for up to six months after becoming infected				
True	61	37.0	56,720	39.3 (39.1-39.6)
False*	9	5.45	-	-
Don't Know	95	57.6	80,177	55.6 (55.3-55.8)
Zika often causes severe illness and death in adults				
True	78	47.3	65,997	45.8 (45.5-46.0)
False*	28	17.0	24,478	17.0 (16.8-17.2)
Don't Know	59	35.8	53,778	37.3 (37.0-37.5)
Symptoms of Zika virus infection include: fever, rash, joint pain, and red eyes				
True*	90	54.6	81,035	56.2 (55.9-56.4)
False	2	1.21	-	-
Don't Know	73	44.2	61,256	42.5 (42.2-42.7)
Most people who get Zika will not have symptoms				
True*	54	32.7	45,115	31.3 (31.0-31.5)
False	48	29.1	46,341	32.1 (31.9-32.4)
Don't Know	63	38.2	52,797	36.6 (36.4-36.9)
There is no treatment for Zika				
True*	36	21.8	29,750	20.6 (20.4-20.8)
False	59	35.8	55,045	38.2 (37.9-38.4)
Don't Know	70	42.4	59,458	41.2 (41.0-41.5)
There is an available vaccine for Zika				
True	47	28.5	40,660	28.2 (28.0-28.4)
False*	32	19.4	27,134	18.8 (18.6-19.0)
Don't Know	86	52.1	76,458	53.0 (52.7-53.3)
Dogs and cats can become sick from Zika				
True	64	38.8	54,881	38.1 (37.8-38.3)
False*	10	6.06	8,827	6.12 (6.00-6.24)
Don't Know	91	55.2	80,544	55.8 (55.6-56.1)
There is still a lot we don't know about Zika virus				
True*	139	84.2	123,003	85.3 (85.1-85.5)
False	4	2.42	-	-
Don't Know	22	13.3	17,980	12.5 (12.3-12.6)
The City of Long Beach has a Zika hotline number for the public to report mosquitoes or ask questions about Zika				
True*	79	47.9	72,698	50.4 (50.1-50.7)
False	4	2.42	-	-
Don't Know	82	49.7	68,285	47.3 (47.1-47.6)
Mosquitoes that transmit Zika prefer to lay eggs in large bodies of water				
True	66	40.0	56,189	39.0 (38.7-39.2)
False*	42	25.5	35,634	24.7 (24.5-24.9)
Don't Know	57	34.6	52,429	36.4 (36.1-36.6)

*Indicates correct response

Table 13: Weighted and unweighted frequencies regarding beliefs of how to avoid getting Zika among households in Long Beach, CA

	Unweighted (N=165)		Weighted (N=144,253)	
Characteristic	N	%	N	% (95% CI)
Wear long sleeved shirts and pants				
Yes*	142	86.1	125,455	87.0 (86.8-87.1)
No	13	7.88	10,625	7.37 (7.23-7.50)
Don't Know	10	6.06	8,173	5.67 (5.55-5.79)
Use mosquito repellent				
Yes*	154	93.3	135,262	93.8 (93.6-93.9)
No	4	2.42	-	-
Don't Know	7	4.24	-	-
Avoid travel to Zika affected areas				
Yes*	156	94.6	136,897	94.9 (94.8-95.0)
No	3	1.82	-	-
Don't Know	6	3.64	-	-
Use a condom or abstain from sex after traveling to Zika affected areas				
Yes*	118	71.5	104,900	72.7 (72.5-73.0)
No	12	7.27	9,808	6.80 (6.67-6.93)
Don't Know	35	21.2	29,545	20.5 (20.3-20.7)
Wear a face mask around those infected with Zika				
Yes	67	40.6	62,237	43.1 (42.9-43.4)
No*	59	35.8	49,814	34.5 (34.3-34.8)
Don't Know	39	23.6	32,201	22.3 (22.1-22.5)
Turn over, cover, or clean items that hold water				
Yes*	154	93.3	134,935	93.5 (93.4-93.7)
No	5	3.03	-	-
Don't Know	6	3.64	-	-
Install, repair, or use window and door screens				
Yes*	160	97.0	139,839	96.9 (96.9-97.0)
No	3	1.82	-	-
Don't Know	2	1.21	-	-
Other				
Yes	21	12.9	17,490	12.3 (12.1-12.4)
No	127	77.9	112,868	79.1 (78.9-79.4)
Don't Know	15	9.20	12,259	8.60 (4.45-8.74)

*Indicates correct response

Table 14: Weighted and unweighted frequencies regarding households who are concerned with diseases that mosquitoes may carry in Long Beach, CA

	Unweighted (N=165)		Weighted (N=144,253)	
Response	N	%	N	% (95% CI)
Yes	123	74.6	108,332	75.1 (74.9-75.3)
No	40	24.2	34,286	23.8 (23.6-24.0)
Don't Know	1	0.61	-	-
Refused	1	0.61	-	-

Table 15: Weighted and unweighted characteristics of households who traveled outside of the U.S. in the past 3 months. Long Beach, CA

	Unweighted (N=33)		Weighted (N=28,238)	
Response	N	%	N	%
Households who traveled outside the U.S.	33	16.8	28,238	16.5 (16.4-16.7)
Travel to Zika affected areas** (n=32)	23	71.9	20,065	73.2 (72.7-73.7)
Travel to non-Zika affected areas (n=32)	9	28.1	-	-
Main reason for travel				
Vacation	19	57.6	16,48	58.3 (57.7-58.9)
Visit Family	7	21.2	-	-
Work	4	12.12	-	-
Other	3	9.09	-	-

*N=1 (weighted N= 817) household reported a pregnant woman traveling to a Zika affected area
**Reported Zika affected countries include: Mexico (n=17), Cambodia (n=1), Guatemala (n=1), Guam (n=1), Panama (n=1), South East Asia (n=1), Vietnam (n=1)

Table 16: Weighted and unweighted characteristics of households who plan to travel outside of the U.S. in the next 3 months. Long Beach, CA

	Unweighted (N=35)		Weighted (N=28,932)	
Response	N	%	N	% (95% CI)
Households who plan to travel outside the U.S.	35	17.9	28,932	16.9
Travel to Zika affected areas** (n=34)	23	67.7	19,125	68.0
Travel to non-Zika affected areas (n=34)	11	32.4	8,990	32.0
Main reason for travel (n=34)				
Vacation	11	32.4	8,990	32.0
Visit Family	16	47.1	13,077	46.5
Work	4	11.8	-	-
Other	3	8.82	-	-

*N=1 (weighted N= 817) household reported a pregnant woman planning travel to a Zika affected area
**Reported Zika affected countries include: Mexico (n=15), Cuba (n=2), Columbia (n=2), Guatemala (n=1), Honduras (n=1), Philippines (n=1), Vietnam (n=1)

Table 17: Vector Control Assessment (N=30)

Characteristic	N	%	95% CI
Vector Control District			
GLACVCD	3	10.0	2.11-26.53
LBDHHS Vector	27	90.0	73.47-97.89
Was treatment and/or surveillance completed in the last 30 days?			
Yes	12	40.0	40.6-77.3

No	18	60.0	22.6-59.4
Priority Rating			
Treat every other week	1	3.70	0.09-18.97
Treat once a week	1	3.70	0.09-18.97
Treat when necessary	25	92.59	75.71-99.09
Potential breeding sites identified at census block?			
Box drain	22	73.33	54.11-87.72
Pool	4	13.33	3.76-30.72
Tires	1	3.33	0.08-17.22
Containers	2	6.67	0.82-22.07
Spa	3	10.0	2.11-26.53
Kids toys	8	26.67	12.28-45.89
Ornamental ponds/fountains	2	6.67	0.82-22.07
Water puddles	8	36.67	19.93-56.14
Planting pots/decorations	18	60.0	40.60-77.34
Other breeding sites:	1	3.33	0.08-17.22
Nursery			
Nearby street sources			
Curb water	19	63.33	43.86-80.07
Storm drain	27	90.00	73.47-97.89
Underground drain/Curvet	10	33.33	17.29-52.81
Nearby drainage channels or breeding sites			
Catch Basin	3	10.00	2.11-26.53
Pump station	3	10.00	27.6-41.3
Flood control-artificially made	8	26.67	12.28-45.89
Ditch	1	3.33	0.08-17.22
Wetlands	1	3.33	0.08-17.22
Sumps	0	0	0
Flood control-natural	2	6.67	0.82-22.07
Street sources other	0	0	0
Other:	13	43.33	25.46-62.57
City of Paramount breeding sites	1	7.14	0.18-33.87
Storm drains	4	28.57	8.39-58.10
Underground drain	9	64.29	35.14-87.24
Mosquito larvae present			
Yes	1	3.33	0.08-17.22
No	29	96.67	82.78-99.92

Traps left at homes or public spaces	2	6.67	0.82-22.07
General Observations			
Adult *Culex* present	18	60.0	40.60-77.34
Adult *Aedes* present	0	0	0
Larvae present	1	3.33	0.08-17.22
Eggs present	0	0	0
High risk populations	26	86.67	69.28-96.24
Travelers	1	3.33	0.08-17.22
Additional comments: School nearby	3	10	2.11-26.53
Risk level of mosquito breeding (N=26)			
High	6	23.08	8.97-43.65
Low	13	50.0	29.93-70.07
Medium	7	26.92	11.57-47.79
Follow up mosquito abatement needed at census block	16	53.33	34.33-71.66
Catch basin, nursery, flood control	1	5.56	0.14-27.29
Mosquito surveillance	11	61.11	35.75-82.70
Pot holes and street/curbs	1	5.56	0.14-27.29
Request service of Deforest Nature Walk	1	5.56	0.14-27.29
Treatment of storm drains	2	11.11	1.38-34.71
Treatment of underground drain	1	5.56	0.14-27.29
Treatment of water puddles and street underground should be treated every other week	1	5.56	0.14-27.29

Appendix I: Health Officer Letter to Respondents

LONG BEACH DEPARTMENT OF HEALTH AND HUMAN SERVICES

Anissa Davis M.D. MPH
City Health Officer

July 20, 2017

Dear Resident(s) of Long Beach:

The Long Beach Department of Health and Human Services, along with the California Department of Public Health is working with residents to prevent mosquito breeding in Long Beach. The *Aedes* mosquito was first identified in Long Beach in June 2017. This mosquito species can transmit Zika virus, however Zika virus has not been found in any of these mosquitoes in California.

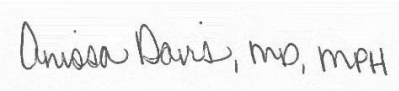
We know that some of our residents have concerns and questions regarding Zika virus, so to help people protect themselves and their families from mosquitoes and Zika virus, we are conducting a door-to-door survey of residents throughout the city. Volunteers in teams of two will ask randomly selected households about mosquito prevention and their general knowledge regarding Zika virus. The information from this survey will be used in the ongoing response to prevent and control Zika virus in Long Beach

The survey will not be used to collect any personal information from residents. Participation in this survey is voluntary and you may decline to participate at any time or refuse to answer any of the questions. Volunteers will be wearing brightly colored vests and will have identification cards.

The information you provide will help Long Beach better respond and prepare for Zika virus in the future. If you have any questions about this survey, please contact the Long Beach Department of Health and Human Services at (562) 570-7907.

Thank you for participating in the survey.

Sincerely,



Anissa Davis M.D., MPH

City Health Officer

Appendix II: Consent Form

City of Long Beach
Department of Health and Human Services
2525 Grand Ave, Long Beach, CA 90815
562.570.7907

Community Assessment for Public Health Emergency Response (CASPER)

Good morning/afternoon, my name is _____ and this is _____. We are with the City of Long Beach Department of Health and Human Services. We are here today talking to Long Beach residents about mosquito prevention and general knowledge of Zika virus.

- We want to get an idea of how we can better prepare people to protect themselves from mosquitoes and Zika virus in Long Beach.
- Your home is one of 210 that has been randomly chosen to be in this survey.
- If you agree to participate, we will ask you some general questions about your household, and certain questions about mosquitoes and Zika virus. We will not ask you any personal questions such as those about your job, education, or place of birth. All the questions will be about your entire household.
- The survey should take no more than 15 minutes to complete.
- Your answers will be kept private, and you can refuse to take part in the survey or refuse to answer any of the questions. Nothing will happen to you or your household if you choose not to take part in the survey.
- We also have some information and materials we would like to leave with you that may be of interest to you and your household.

If you have any questions about this survey you can ask anyone here right now. If you would like to confirm that we were sent by the Long Beach Department of Health and Human Services, you may call 562.570.7907.

Appendix III: Zika CASPER Questionnaire

SECTION 1: PRE-INTERVIEW

Date:	Start time:	Team Name:
Cluster Number:	Survey Number:	Interviewer Initials:
Type of Structure: ☐ Single family ☐ Multiple Unit ☐ Mobile Home ☐ Other (specify) _____		

SECTION 2: DEMOGRAPHICS

1. Did you or members of your household hear about this survey prior to us talking to you today?
   - ☐ Yes → **[GO TO Q1a]**
   - ☐ No
   - ☐ Don't Know → **[GO TO Q2]**
   - ☐ Refused

   1a. How did you or your household members hear about it? **(List options. Check all that apply)**
   - ☐ Social Media
   - ☐ Flyer
   - ☐ Word of mouth
   - ☐ NextDoor [a social network app for your neighborhood]
   - ☐ Other (specify)_____
   - ☐ Don't Know
   - ☐ Refused

2. What is the main language spoken in your household? **(Select one)**
   - ☐ English
   - ☐ Spanish
   - ☐ Khmer (Cambodian)
   - ☐ Other (specify) _____
   - ☐ Refused

3. Including yourself, how many people live in your household? _____

4. Including yourself, how many people living in your household are:
   a. Less than 2 years old: _____
   b. Between 2-17 years old: _____
   c. Between 18-64 years old: _____

d. 65 years old and over: _____

SECTION 3: MOSQUITO PREVENTION

[PROMPT] Now I am going to ask you about mosquitoes around your home.

5. Have you or any household members been bitten by mosquitoes in or around your home within the past month?
   - ☐ Yes → **[GO TO Q5a]**
   - ☐ No
   - ☐ Don't Know → **[GO TO Q6]**
   - ☐ Refused

   5a. What time of day were you or your household members bitten? **(List options. Check all that apply)**
   - ☐ Early morning (5am-7am)
   - ☐ Day time (7am-4pm)
   - ☐ Evening (4pm-8pm)
   - ☐ Night (8pm-5am)
   - ☐ Don't Know
   - ☐ Refused

6. In the last 30 days, have you or members of your household used mosquito repellent?
   - ☐ Yes → **[GO TO Q6a]**
   - ☐ No
   - ☐ Don't Know → **[GO TO Q7]**
   - ☐ Refused

   6a. Which type? **(List options. Check all that apply)**
   - ☐ DEET
   - ☐ Picaradin
   - ☐ Oil of lemon/eucalyptus
   - ☐ Other (specify) _____
   - ☐ Don't Know
   - ☐ Refused

Common mosquito repellent with DEET:
- Off! Deep Woods (Green bottle)
- Repel 100 / Repel Max
- Ultrathon
- Sawyer Premium Ultra Insect Repellent
- Cutter Backwoods

Common mosquito repellent with Picaradin
- Off! Family Care (Orange bottle)
- Sawyer Premium Insect Repellent with 20% Picaridin
- Avon Skin So Soft Bug Guard Plus Mosquito Repellent

[PROMPT] I'm going to read you a set of statements about mosquitoes. Please tell me whether you or your household members believe the statement is TRUE or FALSE:

7. Mosquitoes in Long Beach cause disease	☐ True	☐ False	☐ Don't Know	☐ Refused
8. Mosquitoes in Long Beach carry West Nile Virus	☐ True	☐ False	☐ Don't Know	☐ Refused
9. Mosquitoes in Long Beach carry Dengue	☐ True	☐ False	☐ Don't Know	☐ Refused
10. Mosquitoes in Long Beach carry Zika	☐ True	☐ False	☐ Don't Know	☐ Refused

11. Mosquitoes in Long Beach carry Chikungunya [PRONOUNCED: CHI-kan-GUUN-ya]	☐ True	☐ False	☐ Don't Know	☐ Refused
12. Different types of mosquitoes can transmit different types of diseases	☐ True	☐ False	☐ Don't Know	☐ Refused
13. Mosquitoes cannot breed in very small amounts of water	☐ True	☐ False	☐ Don't Know	☐ Refused
14. Mosquitoes can live inside the home as well as outside	☐ True	☐ False	☐ Don't Know	☐ Refused
15. Mosquito control is important to you and your household members	☐ True	☐ False	☐ Don't Know	☐ Refused
16. Mosquitoes are usually around the size of a quarter	☐ True	☐ False	☐ Don't Know	☐ Refused
17. There are ways to prevent mosquitoes from breeding around your home	☐ True	☐ False	☐ Don't Know	☐ Refused
18. Using mosquito repellent while outdoors can protect from Zika and West Nile Virus	☐ True	☐ False	☐ Don't Know	☐ Refused
19. Mosquito repellent is harmful for children to use [Interviewer prompt: When repellent is used as directed]	☐ True	☐ False	☐ Don't Know	☐ Refused
20. Mosquito repellent is safe for pregnant women to use [Interviewer prompt: When repellent is used as directed]	☐ True	☐ False	☐ Don't Know	☐ Refused
21. Aerial spraying for mosquitoes is safe for humans [Interviewer prompt: Aerial spraying means using airplanes to treat very large areas with insecticides to kill adult mosquitoes]	☐ True	☐ False	☐ Don't Know	☐ Refused

[PROMPT] In the past 30 days, have any of the following actions been done to prevent mosquito breeding around your home [Interviewer prompt: Outside means: balcony, porch, terrace, and yard]? Please answer YES or NO.

22. Cleaned roof gutters	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
23. Dumped outdoor containers holding water	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
24. Covered outdoor containers holding water	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
25. Scrubbed the inside of containers (i.e. buckets, fountains, bird baths) to remove mosquito eggs	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
26. Used full screens on all open windows and doors	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
27. Kept screens on windows and doors in good repair (no holes).	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
28. Sprayed or fumigated for mosquitoes around the home	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
29. Applied chemical, larvicide, or mosquito dunks directly to water	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
30. Used insect light traps	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
31. Other	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A

[If YES to Q31] → Which mosquito removal method did you use?

[PROMPT] There are many places where mosquitoes can breed. Are any of the following items currently outside of your home? [Interviewer prompt: Outside means: balcony, porch, terrace, and yard]?
Please answer YES or NO.

32. Bird baths	☐ Yes	☐ No	☐ Don't Know	☐ Refused
33. Tires	☐ Yes	☐ No	☐ Don't Know	☐ Refused
34. Pet water dish	☐ Yes	☐ No	☐ Don't Know	☐ Refused
35. Flower pots	☐ Yes	☐ No	☐ Don't Know	☐ Refused
36. Fountain	☐ Yes	☐ No	☐ Don't Know	☐ Refused
37. Buckets	☐ Yes	☐ No	☐ Don't Know	☐ Refused
38. Rain barrel	☐ Yes	☐ No	☐ Don't Know	☐ Refused
39. Pool or hot tub	☐ Yes	☐ No	☐ Don't Know	☐ Refused
40. Kiddie pool	☐ Yes	☐ No	☐ Don't Know	☐ Refused
41. Children's toys	☐ Yes	☐ No	☐ Don't Know	☐ Refused

SECTION 4: ZIKA ASSESSMENT

[PROMPT] Next, I would like to ask you some questions about your household's knowledge of Zika virus.

42. Have you or members of your household heard of Zika virus before today?

☐ Yes → **[GO TO Q43]**
☐ No
☐ Don't Know → **[COMPLETE Q42a THEN GO TO Q74 (TRAVEL SECTION)]**
☐ Refused

42a. **[If NO to Q42]** Where do you and your household members usually hear health information? I will read a list of sources, please answer Yes or No for each.

a. Family	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
b. Friends and/or neighbors	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
c. Community meetings	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
d. Place of worship	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
e. Work	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
f. Women, Infants, and Children Program (WIC)	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
g. Private doctor	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
h. Government agency	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
i. Billboards	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
j. Utility bill	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
k. Radio	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
l. Television	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
m. Newspapers	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
n. Internet	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
o. Social Media	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
p. School	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
q. Other	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A

[If YES to "other"] → Specify: _____

[NOTE: SKIP QUESTIONS 43-73 IF NO TO Q42]

43. From which sources have you and your household members heard information about Zika? I will read a list of sources, please answer YES or NO for each.

a. Family	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
b. Friends or neighbors	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
c. Community meetings	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
d. Place of worship	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
e. Work	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
f. Women, Infants, and Children Program (WIC)	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
g. Private doctor	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
h. Government agency	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
i. Billboards	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
j. Utility bill	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
k. Radio	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
l. Television	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
m. Newspapers	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
n. Internet	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
o. Social Media	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
p. School	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A
q. Other	☐ Yes	☐ No	☐ Don't Know	☐ Refused	☐ N/A

[If YES to "Other"] → Specify: _____

44. Do you and your household members think Zika is an important issue in your community?
    - ☐ Yes
    - ☐ No
    - ☐ Don't Know
    - ☐ Refused

[PROMPT] Please answer TRUE or FALSE to the following statements about Zika virus:

45. Zika is preventable	☐ True	☐ False	☐ Don't Know	☐ Refused
46. You can get Zika from having sex with someone who has Zika	☐ True	☐ False	☐ Don't Know	☐ Refused
47. The mosquitoes that carry Zika only bite during dusk and dawn	☐ True	☐ False	☐ Don't Know	☐ Refused
48. The mosquitoes that carry Zika have black and white stripes on their legs	☐ True	☐ False	☐ Don't Know	☐ Refused
49. Zika can be passed from a pregnant mother to her baby	☐ True	☐ False	☐ Don't Know	☐ Refused
50. Zika can be passed to others by breathing the same air as someone who is infected	☐ True	☐ False	☐ Don't Know	☐ Refused
51. Babies born to mothers with Zika may have severe birth defects	☐ True	☐ False	☐ Don't Know	☐ Refused
52. Traveling to areas that have Zika is safe for pregnant women	☐ True	☐ False	☐ Don't Know	☐ Refused
53. Men can sexually transmit Zika to their partners for up to six months after becoming infected	☐ True	☐ False	☐ Don't Know	☐ Refused
54. Women can sexually transmit Zika to their partners for up to six months after becoming infected	☐ True	☐ False	☐ Don't Know	☐ Refused
55. Zika often causes severe illness and death in adults	☐ True	☐ False	☐ Don't Know	☐ Refused
56. Symptoms of Zika virus infection include: fever, rash, joint pain, and red eyes	☐ True	☐ False	☐ Don't Know	☐ Refused
57. Most people who get Zika will not have symptoms	☐ True	☐ False	☐ Don't Know	☐ Refused
58. There is no treatment for Zika	☐ True	☐ False	☐ Don't Know	☐ Refused
59. There is an available vaccine for Zika	☐ True	☐ False	☐ Don't Know	☐ Refused
60. Dogs and cats can become sick from Zika	☐ True	☐ False	☐ Don't Know	☐ Refused
61. There is still a lot we don't know about Zika virus	☐ True	☐ False	☐ Don't Know	☐ Refused
62. The City of Long Beach has a Zika hotline number for the public to report mosquitoes or ask questions about Zika	☐ True	☐ False	☐ Don't Know	☐ Refused
63. Mosquitoes that transmit Zika prefer to lay eggs in large bodies of water	☐ True	☐ False	☐ Don't Know	☐ Refused

[PROMPT] Please answer <u>YES</u> or <u>NO</u> if you or your household members think the following action can help people avoid getting Zika.

64. Wear long sleeved shirts and pants	☐ Yes	☐ No	☐ Don't Know	☐ Refused
65. Use mosquito repellent	☐ Yes	☐ No	☐ Don't Know	☐ Refused
66. Avoid travel to Zika affected areas	☐ Yes	☐ No	☐ Don't Know	☐ Refused
67. Use a condom or abstain from sex after traveling to Zika affected areas	☐ Yes	☐ No	☐ Don't Know	☐ Refused
68. Wear a face mask around those infected with Zika	☐ Yes	☐ No	☐ Don't Know	☐ Refused
69. Turn over, cover, or clean items that hold water	☐ Yes	☐ No	☐ Don't Know	☐ Refused
70. Install, repair, or use window and door screens	☐ Yes	☐ No	☐ Don't Know	☐ Refused
71. Other	☐ Yes	☐ No	☐ Don't Know	☐ Refused

Specify: _____

[If YES to "other"]

72. Are you or members of your household concerned with diseases that mosquitoes may carry?

- ☐ Yes
- ☐ No
- ☐ Don't Know
- ☐ Refused

73. **[Open ended question]** What additional information would you and your household like to receive about Zika? _____ ☐ Don't Know ☐ Refused

SECTION 5: TRAVEL

[PROMPT] Now, I am going to ask you about travel:

74. Have you or anyone in your household traveled outside of the U.S. in the past three months?

- ☐ Yes → **[GO TO Q74a-d]**
- ☐ No
- ☐ Don't Know → **[GO TO Q75]**
- ☐ Refused

74a. To what countries did they travel? _____

74b. What was the main reason for travel? **(Choose one)**

- ☐ Vacation
- ☐ Visit family
- ☐ Work
- ☐ Other (specify): _____

74c. Were any of the travelers pregnant women?

- ☐ Yes
- ☐ No
- ☐ Don't know
- ☐ Refused

74d. **[ONLY If YES to Q42]** Does that country currently have Zika virus transmission?

- ☐ Yes
- ☐ No
- ☐ Don't know
- ☐ Refused

75. Are you or anyone in your household planning to travel outside of the U.S. in the next three months?

- ☐ Yes → **[GO TO Q75a-d]**
- ☐ No
- ☐ Don't Know → **[GO TO CLOSING STATEMENT]**
- ☐ Refused

75a. To what countries will they travel? _____

75b. What is the main reason for travel? **(Choose one)**

- ☐ Vacation
- ☐ Visit family
- ☐ Work
- ☐ Other (specify): _____

75c. Will any of the travelers be pregnant women?

- ☐ Yes
- ☐ No
- ☐ Don't know
- ☐ Refused

75d. **[ONLY If YES to Q42]** Does that country currently have Zika virus transmission?

- ☐ Yes
- ☐ No
- ☐ Don't know
- ☐ Refused

[CLOSING STATEMENT] Thank you for taking the time to complete this survey. Your answers will allow us to better serve you in the future.

Time survey completed: _____

Appendix IV: Zika CASPER Vector Survey

Cluster Number: #__ *Vector Control Program Staff:* _____ *Date:* _____

Weather: _____ *Temp:* _____ *Wind:* _____

□ *LBDHHS Vector* □ *GLACVCD* □ *Compton MAD*

1. **Was treatment and/or surveillance completed in the last 30 days?** □ **Yes** □ **No**
   1a. If yes, what is the priority rating?
   □ Treat once a week □ Treat every other week □ Treat when necessary

2. **Was there any potential breeding sites identified at census block?** □ **Yes** □ **No**
   2a. If yes, please indicate:
   □ Box drain □ Container □ Ornamental Ponds/Fountains
   □ Pool □ Spa □ Water Puddles
   □ Tires □ Kids Toys □ Planting pots/decorations
   □ Other (please describe) _____

3. **What are the nearby street sources?**
   □ Curb water □ Storm Drain
   □ Underground Drain/Curvet □ Other: _____

4. **What are the nearby drainage channels or breeding sites?**
   □ Catch basin □ Drain outlet □ Wetlands
   □ Pump station □ Ditch □ Sumps
   □ Flood control – artificially made □ Flood control – natural
   □ Other (please describe) _____

5. **Were mosquito larvae present?** □ **Yes** □ **No**
   #Dips: _____ #Larvae: □ 0-10 □ 11-25 □ 26+

6. **Were any traps left at homes or public spaces?** □ **Yes** □ No
   6a. If yes, what kind?
   □ GAT (Biogents Gravid *Aedes* Trap) □ Biogents-2 Sentinel Mosquito Trap
   □ AGO (Autocidal Gravid Ovitrap) □ Other: _____

7. **General observations from Vector Control:**
   7a. Adult mosquitoes present □ *Culex* □ *Aedes* □ Other: _____
   7b. Larvae or eggs present □ Larvae □ Eggs □ Other: _____
   7c. Risk level of mosquito breeding: □ High □ Medium □ Low
   7d. Neighborhood assessment: □ High risk populations □ Travelers
   □ Other: _____

8. **Is there any follow up mosquito abatement needed at this Census block?** □ **Yes** □ **No**
   8a. If yes, please describe: _____

9. **Other Notes/Observations:**
   _____
   _____

10. **Please email any pictures you take to zika@longbeach.gov, and make sure to include the address of the home where pictures are taken.**

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